Contribution ID: **181** Type: **Parallel Talk**

Double-Folding Model Analysis of Fusion Reaction

Wednesday 25 October 2017 15:25 (25 minutes)

Fusion reaction play a critical role in stellar evolution and nucleosynthesis [1]. However, the important fusion reaction still carry large uncertainties at Gamow region due to the low cross sections and, the limited theoretical understanding on the mechanisms related to the fluctuations that occur in the cross section [2]. Recently, we investigated $^{12}C+^{12}C$ system, by making use of the so-called multi-channel folding model [3]. Our formulation, the nucleon-nucleon interaction can be described from the DDM3Y density-dependent potential [4] and it allows the inclusion of elastic and inelastic channels and the fusion cross section. Therefore, from the coupled-channel system, elastic and fusion cross-sections are simultaneously calculated. The explicit inclusion of inelastic channels, the imaginary part of the optical potential are only an absorption contribution of short range [5]. The $^{12}C+^{12}C$ results show that the inclusion of inelastic channels and the presence of the Hoyle state improvement the agreement with experimental data [3]. Our model has been applied to the $^{16}O+^{16}O$ and $^{12}C+^{16}O$ systems, but the inclusion of the inelastic channels did not show a strong contribution in the determination of the astrophysical factor in the region of astrophysical interest.

1. M. Wiescher et al., Annu. Rev. Astron. Astrophys. 50, 165 (2012).
2. H. Esbensen et al., Phys. Rev. C 84, 064613 (2011).
3. M. Assunção, P. Descouvemont, Phys. Lett. B 723 355 (2013).
4. G. R. Satchler, W. G. Love, Phys. Rep. 55C, 183 (1979).
5. A. Kobos et al., Nucl. Phys. A 384, 65 (1982).

Author: Dr ASSUNCAO, Marlete (Universidade Federal de Sao Paulo, Brazil.)

Presenter: Dr ASSUNCAO, Marlete (Universidade Federal de Sao Paulo, Brazil.)

Session Classification: Parallel Sessions - NUC

Track Classification: Nuclear Structure, Nuclear Reactions and Exotic Nuclei